the authorities should themselves execute the works prescribed for the purification of the water, and compel the persons interested to pay the cost.

NOTES AND NEWS.

THE United States Hay Fever Association held its sixteenth annual meeting on the 27th of August, at Bethlehem, N.H.

— The Congress of Physiological Psychology held in Paris recently is considered to have been very successful. It was decided that a second meeting should be held in 1892, either in London or in Cambridge, during the month of August.

— A company has been organized in Brussels for the purpose of constructing a railway from Matadi to Stanley Falls on the Kongo. The road, as projected, will have a length of about 270 miles, and is intended to surmount the difficulties of traffic on the cataract region of the lower Kongo.

— Captain Phythian, the Superintendent of the Naval Observatory, Washington, states that the preparations for the expedition to Africa to observe the total eclipse of the sun, which occurs in December next, are being actively pushed forward. The smallness of the appropriation by Congress for this work, $5,000, necessitates careful expenditures, and it will be impossible to send the expedition to St. Paul de Loando, where the observations will take place, except on a Government vessel. The expedition will sail about Oct. 1.

— An ancient treatise on anatomy has been unearthed at the Royal Library at Berlin. It was written in Latin in 1304, by Henry de Mondeville, professor of surgery at Paris and Montpelier, and body-surgeon to Philip le Bel. Surgeon de Mondeville was at one time on English soil as an army surgeon, and his death took place in 1318. The book has never been printed. It is valuable as throwing light upon a period concerning whose medical history there is but little known.

— A. J. Drexel, banker, of Philadelphia, proposes to purchase land, construct the necessary buildings, and provide for the maintenance of instructors and all things necessary for the establishment of an industrial institute for young men and women that will be capable of accommodating a thousand of each sex. This plan is a substitute for one proposed some time since, to establish an industrial college for girls in the country, near Philadelphia. It was found that there were several serious obstacles to such a project, and in its stead Mr. Drexel undertakes to establish and maintain this larger and more general institute. The institute will probably be modeled somewhat after the Cooper Institute of New York, and it is expected that the cost will be about a million and a half of dollars.

— A new Austrian patented process for silvering articles of iron is thus described: The article is first plunged in a pickle of hot dilute hydrochloric acid, whence it is removed to a solution of mercury nitrate, and connected with the zinc polé of a Bunsen element, gas carbon of platinum serving as the other pole. It is rapidly covered with a layer of quicksilver, when it is removed, washed, and transferred to a silver bath and silvered. By heating to 572 degrees F. the mercury is driven off, and the silver firmly fixed on the iron. To save silver the wire can be first covered with a layer of tin; 1 part of cream of tartar is dissolved in 8 parts of boiling water, and one or more tin anodes are joined with the carbon pole of a Bunsen element. The zinc pole communicates with a well-cleaned piece of copper, and the battery is made to act till enough tin has deposited on the copper, when this is taken out and the ironware put in its place. The wire thus covered with tin chemically pure and silvered is much cheaper than any other silvered metals.

— Mr. M. E. Allison of Hutchinson, Kan., in a letter to *The American Field*, says, "An experience I had lately with a quail (Bob White) was so interesting to me, I thought it might interest some of my brother sportsmen who are better acquainted with the habits of the quail than I am. In the corner of our coursing park there was a quail's nest, and it was so near to the road that when we would be passing by it, to and from the park, the old quail would fly away, and it was always the male bird. My never seeing the female around there is what attracted my attention; and I noticed that the male was crippled in one leg, and only used one in hopping about, and appeared to be crippled otherwise. There were twelve eggs in the nest, and after ten or twelve days from the time I first noticed it the young brood all hatched, and the old male bird took them and left the nest. The female bird was never seen anywhere in that neighborhood by myself or any of the men at work there, and some of us were there every day; but we never failed to find him on the nest. I came to the conclusion that someone had killed the female while she was laying the eggs, and at the same time wounded the male; and he, knowing his companion was gone, took charge of the nest and set on the eggs, hatched them, and is now raising the little orphans on his own hook. If these are the facts, and it seems to be so, is it not a very remarkable case?"

— At a recent meeting of the Paris Geographical Society, M. G. Rolland contributed some valuable data to the discussion, recently carried on between him and M. E. Blanc, on the subject of the yield of artesian wells in north Africa. After expressing his agreement with M. Blanc regarding the fundamental principles which regulate artesian basins generally, he proceeded to controvert the latter's assertion that in the case of the Ued Rir the admitted gain in the yield of water was not in proportion to the number of new wells sunk. M. Rolland adduced a table, recently compiled by him and M. Jus, showing the number of French wells in the Ued Rir, their total output per minute, and the average output of each well for the nine years ending in June, 1889. In 1880 there were 64 wells, with a total yield of 22,865 gallons a minute, or an average of 357; in 1889 there were 127 wells, with a total yield of 44,908 gallons a minute, or an average of 354, showing that while the number of wells had doubled, the yield had very nearly doubled also. He admitted that in certain parts of the Ued Rir, notably the central part, the limit of yield had been reached. He concluded by suggesting that there should be some authority to regulate the number and position of all new wells to be sunk.

— Henry L. Bolley, assistant botanist at the Indiana Agricultural Experiment Station, Purdue University, thus sums up the results of some investigations on wheat rust recently made by him. The rusting of wheat is due to the attacks of several species of minute fungi. The disease is propagated by means of various spores, one form of which is developed upon various determined and undetermined plants, mostly weeds. This side form is not, as yet, proved to be essential to the continued life of the parasites, but its destruction decreases the danger from serious attacks of the disease. One species (*P. rubigo vera*) in its uredo stage is able to pass the winter in the tissues of the young wheat plant. In warm weather, any conditions of the soil or atmosphere which tend to keep the wheat leaves constantly wet are conducive to the rapid spread of the disease. Low-lying, rich soils are most subject to the disease. No variety of wheat is known to be rust proof, yet some possess greater powers of resistance than others. Though not proved, an excess of nitrogen in the soil is to be considered, probably, as liable to produce wheat easily affected by rust. If fertilizers are to be applied to such lands, those containing only inorganic elements are most advantageous so far as immunity against rust is concerned. In districts liable to severe visitations of the disease, early-ripening wheats are to be preferred.

— Henry Shaw, a well-known philanthropist of St. Louis, died on Aug. 25 in that city. He was an Englishman, and at the age of nineteen years he came to this country, settling in St. Louis in 1819, where he embarked in the hardware business. After twenty years of commercial life he amassed a sufficient fortune to enable him to retire from business. He made a tour of the world, occupying about ten years in travel. On his return to St. Louis he began the study and cultivation of plants and flowers, and it was in the prosecution of these studies that the botanical gardens containing fifty acres, near Tower Grove Park, had their origin. He made the park and gardens free to the public, and now, with his death, the gardens become the property of the State of Missouri. Tower Grove Park, comprising 350 acres, becomes the property of the

city. The Shaw estate is estimated to be worth $2,500,000, and it is thought the greater part will be left to St. Louis in various bequests.

— The Royal Danish Academy of Sciences invites research on the following among other subjects: Compounds of alcohol radicals with copper, silver, or gold, and compounds of polyvalent alcohol radicals with metals (all unknown at present): prize, a gold medal. The fatty acids in the fat of butter; to be isolated and determined, and relations indicated especially between the quantities of oleic acid and those of palmitic acid and their higher homologues: prize about $160. The *Mycorhizæ* of the beech; are they different in different kinds of humus? does the structure of the mycelium give a basis for classification? is there a reciprocal symbiosis, the fungus preparing food for the plant, etc.: prize, about $160. Memoirs to be sent to Professor Zeuthen of Copenhagen before Oct. 31, 1890, except in the last case, for which the date is Oct. 31, 1891.

— The drawf trees which the Japanese horticulturists are showing at the Paris Exhibition are attracting much attention. Pines, thujas, and cedars, said to be one hundred or one hundred and fifty years old, are only eighteen inches high, and with such specimens, as *Garden and Forest* says, it would be easy to have a coniferous forest on a balcony. These arboreal deformities are produced by great labor, and, if the truth is told about their ages, this work of arresting the tree's development and forcing it into contorted forms must be persisted in by several generations of foresters. All this painstaking is hardly paid for by the beauty of the resulting abortions, but, as has been suggested, a look at these trees will explain where the fantastic forms come from which serve as models for the plants we see on the lacquered trays, bronzes, and embroideries which come from Japan.

— Until recently very little was known of the fossil flora of Japan. The first systematic treatment of it is found in the work of Dr. H. T. Geyler who, in 1877, described and figured twelve species of jurassic plants collected by Dr. J. Rein in the valley of the Tetorigawa in Kaga. Three years later the same author referred to the occurrence of *Carpinus grandis Unger* in the tertiary formation of Mikawa in Honsha. This was the only literature relating to the fossil flora of Japan down to the year 1881, when for the first time, Professor A. G. Nathorst of Stockholm published a preliminary communication on more than seventy species of tertiary plants collected by Professor Nordenskiold on his visit to Japan during the famous Vega expedition around the Asiatic continent. This work was soon followed by a more complete one, in which leaves collected by Hilgendorf are also described. The work principally treats of the young pliocene, or, perhaps, the oldest quaternary flora of Mogi, a very important group, from which the author was able to draw interesting conclusions as to the origin and climatic relations of the recent flora. In this work he also mentions twelve species of the older tertiary plants from Ezo (Hokkaido) and Honshu determined by Leo Lesquereux, but which were up to that time yet unpublished. During the last two years the Geological Survey has sent to Professor Nathorst a large collection of tertiary plants for investigation, on a part of which he has already drawn up a brief preliminary report. These were exclusively from northern and central Japan. For the most part they belonged to the older tertiary, corresponding in age to the floras of Sachalin and Alaska. Professor Nathorst mentions in this paper plants collected by Mr. Petersen at Nagasaki. About these, and the plants last sent, chiefly including those of Shikoku and Kyushu, he will write other memoirs. By the study of these fossils quite a comprehensive idea may be formed regarding the tertiary flora of Japan; but as to the mesozoic flora nothing further has been done since the publication of the work by Dr. Geyler. Since Dr. Rein's discovery of jurassic plants, the valley of the Tetorigawa has been twice visited by geologists. The first visit, a very short one, was made in 1880 by Dr. B. Koto. On his return he made a brief report, accompanied by a sketch-map of the river valley and four geological sections. The second and more extensive visit was undertaken by Mr. Tadatsugu Kochibe. In 1883 the Imperial Geological Survey undertook the reconnoisance of various parts of central Japan, one of which was a region including the provinces of Kaga, Hida, Echizen, and Etchu, between the parallels of 35° and 37° north latitude. The survey was conducted by Mr. T. Kochibe as geologist and Mr. K. Kodari as topographer. This survey, which lasted three months, brought back many interesting fossils, some of which, together with those formerly collected by Dr. Koto, form the subject of a paper, by Matajiro Yokoyama, recently published in the Journal of the College of Science of the Imperial University of Japan. As a detailed account of this survey will appear in future reports of the Geological Survey, the gentleman mentioned merely indicates briefly the general outline of the geographical and geological features of this part of Japan.

— In February of this year, the *Deutsche Heeres-Zeitung* gave some interesting particulars of the new, almost smokeless powders which are being made by the united Rhine and Westphalian factories. With a 0.5-centimetre Krupp gun, 35 calibres long, an initial velocity of 527 metres was given to a projectile of 18 kilograms, with 3.9 kilograms of the powder, under a pressure of 1,955 atmospheres. It is now reported that, at a subsequent trial with the same gun, a projectile of 18.15 kilograms received an initial velocity of 542 metres, with a pressure of only 1,942 atmospheres, 4 kilograms of the powder being used, while, when the charge was increased to 4.5 kilograms the velocity was 586 metres, and the average pressure 2,300 atmospheres. The following are the results with another variety of the same large-grain powder. With a 12-centimetre gun and projectile or 26.2 kilograms: Charge, 5 kilograms; velocity, 472 metres; pressure, 1,240 atmospheres. Charge, 7.5 kilograms; velocity, 621 metres; pressure, 2,270 atmospheres. Gun of 13 centimetres, and projectile of between 30.01 and 30.27 kilograms: Charge, 5.5 kilograms; velocity, 512 metres; pressure, 1,340 atmospheres: Charge, 6.5 kilograms; velocity, 625 metres; pressure, 2,010 atmospheres. Gun of 15 centimetres, and projectile of 51.5 kilograms: Charge, 10 kilograms; velocity, 501 metres; pressure, 1,630 atmospheres. Charge, 14 kilograms; velocity, 617 metres; pressure, 2,550 atmospheres.

— In summing up the Maybrick case, Justice Stephen's remarks were rather severe upon expert testimony, medical and other. He warned the jury about the uncertainty of medical science, or rather art, and reminded them of the old saying which described a doctor as "a man who passed his time in putting drugs of which he knew little into a body of which he knew less." He also had a fling at the experts in other fields who appear before parliamentary committees and the like. He said a man going on the stand, and "calling himself this, that, or the other, by no means qualified him to receive unhesitating belief." "A great deal of what he might call scum had to be taken off the testimony of skilled witnesses, for — of course, probably insensibly to themselves — they were apt to become advocates rather than witnesses."

— Some new light on the subject of indirect vision, i.e., vision with the lateral parts of the retina, is thrown by recent experiments made by Kirschmann, and reported in *Nature*. The common idea that the sensitiveness of the retina diminishes outwards to the periphery appears to be incorrect. There is an objective diminution of light-action when a source of light is moved away laterally from the middle of the field of vision, for the mass of penetrating light gets less. Hence, were the diminishing sensitiveness a fact, a luminous surface should seem to lose brightness when moved to the side; but it does not, though it appears less distinct in outline and modified in color. Kirschmann placed two rotatory disks made up of moveable black and white sectors, giving any degree of brightness, before the observer; who shut one eye, and looked at the middle of one disk, about a metre and a half from him, while he gave his attention to comparing the brightness of the second disk, seen at different angels, by indirect vision. The figures from numerous experiments prove that in the horizontal meridian the sensibility to brightness has a maximum at 22° to 25° from the centre, while in the vertical direction the maximum is at 12° to 15°. The growth of sensibility is much greater in the horizontal than in the vertical direction, and the upper part of the retina is superior in this respect to the lower. This corresponds to the needs of vision. Indirect vision with lateral parts of the retina is more important than that with the upper and lower regions, and the upper half is more important than the lower.